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THESIS

THE EFFECT OF MORAL WAIVERS
ON FIRST-TERM, UNSUITABILITY
ATTRITION IN THE MARINE CORPS

by

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March 1996

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**THE EFFECT OF MORAL WAIVERS ON FIRST-TERM,
UNSUITABILITY ATTRITION IN THE MARINE CORPS**

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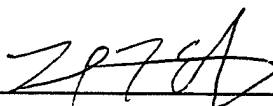
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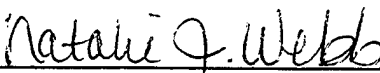


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ABSTRACT

This thesis examines the effects of moral waivers on unsuitability attrition in the Marine Corps. The objectives are to: (1) determine the relationship between moral waivers and first-term, non-EAS unsuitability attrition in the Marine Corps; (2) determine the relationship between demographic characteristics and first-term, non-EAS unsuitability attrition in the Marine Corps; (3) compare the effects of moral waivers among first-term, non-EAS unsuitability attrition, "other than unsuitability" attrition, and "overall" attrition; and (4) compare the relationship between moral waivers and first-term, non-EAS attrition (unsuitability, "other than unsuitability," and "overall") in the Marine Corps with that of the Navy. This thesis uses data from Defense Manpower Data Center for Marine Corps cohorts FY88 thru FY91 and Navy Cohorts FY88 and FY90. Cross-tabulations and binary logistic regression models are employed to analyze the effects of moral waivers on unsuitability attrition. The results show that individuals who receive a moral waiver for less than three minor non-traffic offenses, misdemeanors, a felony, preservice drug use, or preservice alcohol abuse are more likely to attrite for unsuitability than individuals who do not receive a moral waiver at accession.

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I. INTRODUCTION

Over the past decade a considerable amount of research has been conducted to determine how to reduce first-term, non-end-of-active service (non-EAS) attrition of enlisted Marines. First-term, non-EAS attrition refers to an individual who leaves the service before completion of his first contract. The Marine Corps experiences an average of 30 percent first-term, non-EAS attrition each year. Previous research shows a strong relationship between an individual's education and mental aptitude and his behavior and performance in the military. These findings have led to increased efforts by the Marine Corps to recruit more high quality individuals (High School Graduates and individuals with AFQT scores in categories I-III A). The percentage of high quality recruits in the Marine Corps rose from approximately 30 percent in 1979 to approximately 70 percent in 1992 [Ref. 1]. Despite this increase in high-quality recruits, the Marine Corps has not achieved a significant reduction in the annual average first-term, non-EAS attrition.

First-term, non-EAS attrition is expensive. These attritions result in nonrecoverable training expenditures, affect military readiness, and require additional expenditures for personnel replacement to maintain first-term requirements. Quester (1993) finds that the costs of non-EAS attrition after the first year of service for first-term Marines are in excess of \$100 million each year. He states "These are real costs because these Marines must be replaced with new accessions."

Reducing first-term non-EAS attrition has been a concern of the Marine Corps in the past, and has recently become a priority. General Charles Krulak, Commandant of the Marine Corps, in the Commandant's Planning Guidance dated 1 July 1995, states:

Non-EAS attrition is a sea anchor on a Marine Corps moving at battle speed. Every year we lose one-third of our first-term force before they

complete their first enlistment. The drag this has on our recruiters, our entry level training pipeline, and our entire manpower management process has gone on too long. It is a drain on our personnel and fiscal resources that we will no longer accept.

An area that has received little attention is the effect of moral waivers on first-term, non-EAS attrition, specifically on unsuitability attrition. First-term, non-EAS attrition occurs for a variety of reasons. Some of the more common reasons are: fraudulent enlistment, hardship, physical disability, unsatisfactory performance, misconduct, and drug use.

Current research on reducing first-term, non-EAS attrition focuses on policy changes that could affect attrition, such as height/weight standards, pregnancy, and granting of medical waivers. Potentially, a recruit who receives a moral waiver is not more likely to attrite for reasons such as death, medical discharge, or hardship discharge than a recruit who does not receive a moral waiver. However, he may be more likely to attrite due to an unsuitability discharge.

A. BACKGROUND

The Marine Corps sets moral character standards for all its recruits. These standards deal with previous criminal behavior and substance abuse. Some patterns of an individual's past behavior render the individual ineligible for service, while other patterns that are less serious require an individual to receive a moral waiver to be accepted for enlistment. In the past, the Marine Corps has been believed to have a rehabilitative effect on some recruits with a history of behavioral problems by offering a change in environment, skill training, and discipline. [Ref. 2] Although this is a valid issue, it is not a primary function of the Marine Corps to provide rehabilitation to the country's youth. However, a limited supply pool requires the Marine Corps to accept some individuals with behavioral or moral problems. Of the

22,622 Marine Corps accessions between October 91 and June 1992, 12,566 received a moral waiver. [Ref. 3]

In recent years the military supply pool has been shrinking. A 1993 Youth Attitude Tracking Survey conducted by Defense Manpower Data Center (DMDC) showed the propensity to enlist in the Armed Services was at its lowest level since 1984, and the number of citizens that qualify for military service has dropped by more than 25 percent since 1985. In addition, the Marine Corps FY95 accession quota increased by 11 percent. [Ref. 4] Because of these trends, the moral waiver issue is increasingly important.

Marine Corps recruits are required to meet moral standards in order to: prevent the enlistment of individuals whose social habits are a threat to unit morale and cohesiveness; screen out likely serious disciplinary problems; and ensure enlistees and their parents that the enlistee will not be in close association with criminals. [Ref. 5] Marine Corps standards require that certain involvement with law agencies and drug or alcohol abuse disqualify an individual for service. The recruit is the primary source from which the recruiter gathers information on moral qualification for enlistment. The recruiter obtains additional information through the Entry-Level National Agency Check (ENTNAC), which is required for all recruits. A portion of the ENTNAC checks FBI records for past criminal behavior. Local and state records are not accessed for each recruit.

The Marine Corps categorizes prior involvement with law agencies in the following five categories: minor traffic offenses, serious traffic offenses, minor non-traffic offenses, serious offenses, and felony offenses. The Marine Corps provides its recruiters with the Uniform Guide List, shown in Appendix A, which lists typical offenses in each of these categories. A recruit requires a moral waiver if he has committed: five or more minor traffic offenses; two or more serious traffic offenses;

two to nine minor non-traffic offenses; one to five serious offenses; or one felony. A recruit is not eligible for a moral waiver if the number of offenses exceeds these limits, and is denied enlistment. The approval authority for these waivers depends on the number or type of offense. The three levels of approving authority are: Commanding Officer (CO), Recruiting Station; CO, Marine Corps District; and CO, Recruiting Region.

The Marine Corps, after verbal screening of a recruit's past involvement with drugs or alcohol, may grant a moral waiver to a past drug or alcohol abuser. Although waivers may be granted for some past drug or alcohol involvement, no waivers are authorized to applicants who have a history of drug addiction or alcohol dependency, or a court conviction for any drug offense (except simple possession of cannabis [30 grams or less] or possession of steroids). If an applicant qualifies for a drug or alcohol waiver, he is screened through the same three levels of approving authority used for involvement with law agencies, depending on the type of drug and the extent of previous use.

The determination for granting moral waivers is subjective. Marine Corps guidance to the approval authority is to use the "whole person" concept, which involves evaluating if the applicant's strengths outweigh the reasons for disqualification, and the applicant's potential for successful service in the Marine Corps. Other factors considered include age at the time the offense was committed, time since the offense, and an applicant's other enlistment qualifications.

The granting of moral waivers is often driven by the supply of applicants. It is necessary for the Marine Corps to grant moral waivers in order to meet first-term enlistment requirements. However, the cost of attrition warrants further investigation into the relationship between moral waivers and first-term, non-EAS attrition. If the

Marine Corps can identify high-risk individuals, revising the criteria for granting moral waivers may reduce first-term unsuitability attrition and its associated costs.

B. OBJECTIVES

The objectives of this thesis, in order of priority, are:

1. Determine the relationship between moral waivers and first-term, non-EAS unsuitability attrition in the Marine Corps.
2. Determine the relationship between demographic characteristics and first-term, non-EAS unsuitability attrition in the Marine Corps.
3. Compare the effects of moral waivers among first-term, non-EAS unsuitability, other than unsuitability, and overall attrition.
4. Compare the relationship between moral waivers and first-term, non-EAS attrition (unsuitability, other than unsuitability, and overall) in the Marine Corps with the Navy.

C. SCOPE, LIMITATIONS, AND ASSUMPTIONS

1. Scope

This thesis focuses on the effect of moral waivers on unsuitability attrition in the Marine Corps. Although this thesis also analyzes other types of attrition, as well as data from the Navy, the research and hypotheses concentrate on Marine Corps first-term, non-EAS unsuitability attrition.

2. Limitations

The primary limitation of this research is potential bias in estimating the effect of moral waivers on non-EAS attrition. The Services rely heavily on self-admittance of past behavior to identify individuals who require a moral waiver. Not all individuals admit to past behavior, and thus enter the Service without a moral waiver. Generally, this bias leads to underestimating the effects of moral waivers on attrition.

Other limitations include the author's lack of first hand experience in recruiting and limited involvement with the Navy. To compensate, the author researched recruiting policy and examined the recruiting manuals for both the Marine Corps and Navy, and interviewed recruiters from both Services. The author is familiar with the Marine Corps leadership philosophy, and, as a Commander, had personal experience in Marine Corps discharge procedures.

3. Assumptions

In conducting this research, the author makes the following assumptions:

1. The percentage of individuals who enter the Service who do not admit to past behavior requiring a moral waiver is approximately the same for each year studied.
2. The recruiters' subjective process of granting moral waivers during the period studied remains relatively constant.
3. The leadership philosophy for initiating discharges for "failure to meet minimum behavioral or performance criteria" has generally remained constant.

D. ORGANIZATION OF THE STUDY

Chapter II contains general information on crime theory and a discussion of previous research on moral waivers. Chapter III describes the data files used and defines the variables analyzed in this study. Chapter IV gives a preliminary analysis of the data. Chapter V presents the empirical results of the models. Chapter VI provides conclusions and recommendations based on the results of Chapters IV and V.

II. LITERATURE REVIEW

A. CRIMINAL BEHAVIOR THEORY

The definition of crime is broad and encompasses a variety of behaviors. Stealing a candy bar, striking another person, parking by a fire hydrant, robbing a bank, and murder are all crimes. Although society differentiates between the seriousness of crimes, persons who commit criminal acts share some characteristics, such as lack of concern for the rights of others and a disregard for the consequences of one's act. [Ref. 6]

There are many theories, none well accepted, on what causes crime. These theories fall into three main categories: biological, psychological, and sociological. Biological theories suggest that a criminal is born with a chromosomal abnormality. [Ref. 7] Psychological theories focus on an individual's having an antisocial personality and low self-control. [Ref. 8] Sociological theories suggest an individual's family, economic, and social status cause certain behavioral problems. [Ref. 9]

Of interest to this thesis is research on recidivism, defined by Webster as "a tendency to relapse into a previous condition or mode of behavior," in this case criminal behavior. The common cause model is most widely used in studying recidivism. This model states that the best predictor of current behavior is past behavior. [Ref. 10] Criminologists who study recidivism encounter the same problem as Marine recruiters, that is, not every individual who commits a crime is arrested. Although criminologists can use self-reports in which the subject suffers no consequences for the truth, the Marine recruiter does not have that luxury. Criminologists, through interviews and questionnaires, discovered that a large percentage of all males will be arrested at least once in their lives for something more

serious than a traffic infraction, and an even larger percentage, approximately 90 percent, commit at least one criminal offense (whether arrested or not). [Ref. 11] The Marine Corps accepts these findings and does not require a moral waiver if a recruit has one minor non-traffic offense.

Wilson states that most juvenile offenders do not become adult offenders, but almost all chronic adult offenders were chronic juvenile offenders. [Ref. 12] Wolfgang, in a Philadelphia cohort study, found that of males who had five or more police contacts by the age thirty (chronic offenders), 87 percent already had five or more by the age of eighteen. [Ref. 13] Shannon, in a Wisconsin cohort study, found that only five percent of individuals with no police contacts by age 18 have five or more police contacts by the time they are 32. However, 64 percent of individuals with five or more police contacts by age 18 have an additional five or more police contacts between ages 18 and 32. [Ref. 14] These studies reveal a correlation between the number of crimes an individual commits before he is 18 and the likelihood of continuing this process.

Although there are many theories on what causes crime, the National Youth Survey finds that among the young who commit many delinquencies, there are patterns associated with age, sex, race, intelligence, and education. [Ref. 15] Of these demographic characteristics, age has the most impact on criminal behavior. [Ref. 16] Gottfredson (1990) gathered information from numerous studies and concluded that 17-to-19 year olds have the highest arrest rates per population, followed by a steady decline in subsequent age groups. In 1991, 68.3 percent of those arrested for serious offenses and 47 percent of those arrested for nonserious offenses in the United States were under 25 years of age. [Ref. 17] Although crime declines with age, the differences in crime tendencies across individuals remains stable. [Ref.

18] Since the Marine Corps recruits from a younger age group, it is difficult to identify chronic offenders.

Criminologists, through self reports and analysis of arrest records, show that males are five to fifty times more likely to commit crimes than females. [Ref. 19] In 1991, 81 percent of those arrested for serious crimes and 82 percent of those arrested for nonserious crimes in the United States were males. [Ref. 20] This is explained by the fact that females are less aggressive than males and by traditional sex roles in crime.

Most studies on race and crime focus on the differences between blacks and whites. Empirical studies suggest that blacks commit more crimes (nonserious and serious) than whites. A study conducted by the National Academy of Sciences in 1983 computed black/white ratio averages of 1.8:1 for nonserious crimes and 3.1:1 for serious crimes. [Ref. 21] In 1991, blacks, with a population representation of 12 percent, accounted for 29 percent of the arrests in the United States, whereas whites, who represent 74 percent of the population, accounted for 69 percent of the arrests. [Ref. 22] Hispanics were not separately identified in the arrest data. Theories as varied as the "subculture of violence," socioeconomic status, and police discrimination have been advanced to explain these findings. [Ref. 23]

There appears to be a link between criminality and low intelligence, with studies showing that average criminals tend to have lower intelligence scores than noncriminals. Both Wolfgang's Philadelphia cohort study and the Paxtent study found that recidivists had lower IQs than nonrepeating offenders. [Ref. 24] Hirschi and Hindelang, in a study of a California county's police records, found a higher frequency of recidivists among males that have IQ scores in the 20th to 39th percentile. [Ref. 25] These percentiles correspond to AFQT Categories IV and IIIB. Studies by Wolfgang and Glueck establish a relationship between delinquency and

schooling. Wolfgang, in a birth cohort study, found that only 9 percent of chronic offenders graduated from high school, compared to 58 percent of one-time offenders and 74 percent of nonoffenders. [Ref. 26] Glueck (1968), in a controlled study, found that only 2 percent of his delinquent control group graduated high school, and half of this control group disliked school because they resented the restrictions and routine of school. [Ref. 27]

B. MORAL WAIVER RESEARCH

Research on the relationship between moral waivers and unsuitability attrition is limited. Reasons for this include: problems in accurately identifying all offenders; vagueness of the moral waiver codes; and differences between the Services in classifying offenses and granting moral waivers.

Flyer (1995), in comparing the criminal records of three states with Service enlistment records, found that over 30 percent of all new recruits enlist with a juvenile or adult record, and that less than half of them are identified through the moral waiver process. This is due mainly to the military's reliance on self-admittance of previous offenses, and the ENTNAC accessing only FBI records. Before 1986, recruiters were required to conduct local agency checks on all recruits. These checks were considered burdensome and unproductive because many law enforcement agencies were unable or unwilling to provide records to recruiters. [Ref. 28] Currently, only applicants who admit to an offense receive a local agency check.

All moral waivers granted are classified in one of eight categories: minor traffic offenses; less than three minor non-traffic offenses; three or more minor non-traffic offenses; non-minor misdemeanors (serious offense); juvenile felonies; adult felonies; preservice drug abuse; and preservice alcohol abuse. The Uniformed Guide List for typical offenses (Appendix A) shows a wide variation of offenses in each category. For example, both curfew violation and theft (value less than a \$100) fall

into the category of minor non-traffic offense. The data base only reveals a minor non-traffic offense, not the actual offense. A more detailed explanation of the offense would enable a more accurate analysis.

All branches of the Service classify moral waivers using the same categories. However, each branch has its own policy regarding the circumstances under which each moral waiver will be granted. The main policy differences between the Navy and the Marine Corps concern traffic violations, number of minor non-traffic offenses and misdemeanors, and preservice drug and alcohol use.

The Marine Corps distinguishes between minor and serious traffic offenses, whereas the Navy does not. The Marine Corps requires a traffic waiver if an accession has five or more minor traffic offenses or two or more serious traffic offenses at any time in the past. The Navy requires a traffic waiver only if the accession has six or more offenses in the preceding year.

Marine Corps and Navy policies differ regarding minor non-traffic offenses and misdemeanors. The Marine Corps requires a waiver if an accession has two to nine minor non-traffic offenses or one to five serious (misdemeanor) offenses. The Navy requires a waiver for its basic enlistee if an accession has three to five minor non-traffic offenses or one to two misdemeanors. For the Navy's specialty programs (nuclear, electrical, divers) a waiver is required if an accession has two minor non-traffic offenses or one to two misdemeanors.

The Navy's criteria for drug and alcohol waivers for basic enlistees is less stringent than the Marine Corps. The Marine Corps requires a drug waiver if the accession experimented with or was a casual user of marijuana. The Navy requires a drug waiver for these accessions only if entering a specialty program, not for its basic enlistees. An accession who had a previous drug addiction or alcohol dependency is not eligible for enlistment in the Marine Corps. He is ineligible for

enlistment in the Navy's specialty programs, but may qualify for basic enlistment after proper screening.

The Services also differ in the percentage of their recruits who are granted moral waivers. The Marine Corps has a higher percentage of individuals who receive a traffic waiver than the other Services. [Ref. 29] The Navy has a larger percentage of individuals with arrest waivers than other Services. [Ref. 30] The Air Force has a smaller percentage of individuals with moral waivers than the other Services. [Ref. 31] The reasons for these differences include differing policies and the supply of accessions available to each Service.

Each of the separate studies conducted by Means (1983), Fitz (1988), and Flyer (1995) found a relationship between an individual who is granted a moral waiver and unsuitability attrition. These researchers defined unsuitability attrition as those individuals who receive an Inter-Service Separation Code (ISC) that falls in the category of "failure to meet minimum behavioral or performance criteria." Appendix B lists the 27 specific discharges that comprise this category. Personnel who are separated under these ISCs have failed to adapt to military life.

Means (1983), Fitz (1988), and Flyer (1995) studied the relationship between moral waivers and unsuitability attrition by race, gender, AFQT category, and education level. They did not use statistical models in their analyses. Flyer and Means each analyzed five cohorts, FY84-FY88 and FY77-FY81 respectively, while Fitz analyzed the FY82 cohort. Each analyst categorized the moral waiver variables differently. Means used the eight DMDC categories of moral waiver codes. Fitz lumped the eight DMDC categories into the following three: traffic offenses, misdemeanor (all minor non-traffic offenses and misdemeanors), and other (juvenile felony, adult felony, preservice drug abuse and preservice alcohol abuse). Flyer used only previous juvenile and adult arrest records.

With regard to the Marine Corps, the studies by Means (1983), Fitz (1988), and Flyer (1995) generally show that:

1. Whites are more likely to receive unsuitability discharges than other races;
2. Males are more likely to receive unsuitability discharges than women;
3. Non-high school graduates and individuals in the lower AFQT categories are more likely to receive unsuitability discharges; and
4. Individuals who entered the Marine Corps with a moral waiver for a non-traffic offense are more likely to receive an unsuitability discharge than individuals without a moral waiver.

III. DATA AND VARIABLE SPECIFICATION

A. DATA

This thesis uses data obtained from DMDC's Military Entrance Processing Command (MEPCOM) files. Marine Corps enlisted cohort files for Fiscal Years 88, 89, 90, and 91, and Navy enlisted cohort files for Fiscal Years 88 and 90 make up the data sets. DMDC maintains MEPCOM cohort files for each branch of the Service, which contain data about accessions at the time of entry into the Armed Forces. DMDC updates the MEPCOM files at the end of each fiscal year using Department of Defense Active Duty Enlisted Master Inventory and Loss files, which contain the most recent active duty and loss data on each enlisted service member.

The statistical analysis in this thesis uses four years of data for all cohorts, except Navy FY90. Only three years of data were available for this cohort. Previous research on attrition finds that after the first six months of service, the attrition rate is between 13 and 15 percent, with the remainder of attrition leveling off at about 3 percent for each six-month period. [Ref. 32] Navy FY90 cohort can still help determine if there is a relationship between variables, although some findings for this cohort will be underestimated. Results that are affected will be noted throughout the study.

The following restrictions were placed on each cohort:

1. This study only uses accessions with initial enlistments of four or more years. Previous research on attrition follows this criterion to avoid having contract length affect the attrition rate. [Ref. 33]
2. This study excludes prior service accessions. Prior service accessions are personnel who completed a first-term, left the Service, and then returned. Although these individuals are included in a cohort with new accessions, they are not in their first-term of enlistment.

3. Observations with unknown values in the education or Armed Forces Qualification Test (AFQT) Group fields were deleted. Education and AFQT Group are two of the control variables in the model.

The sample size for each cohort is provided in Table 1.

Table 1. Numbers of Observations in Individual Cohorts

Service	FY88	FY89	FY90	FY91
Marine Corps	34,298	32,117	32,061	28,176
Navy	82,355	--	68,096	--

B. VARIABLE SPECIFICATION

This study uses cross-tabulations and logistic regression models to analyze the data. The dependent and explanatory variables used for these analyses are described below.

1. Dependent Variables

The thesis uses three different dependent variables to allow a general comparison of the effects of moral waivers among these dependent variables.

- a. **Unsuitability Attrition.** Defined as individuals in the data sets who serve less than four years on active duty and receive an Inter-Service Separation Code (ISC) that falls in the category "failure to meet minimum behavioral or performance criteria." This study uses four years to measure the successful completion of first-term of service instead of the traditional forty-five months since the ISCs allow for Marines who are released early for reasons such as to attend college or enter a police academy. Previous research concludes that little attrition occurs among five- and six-year enlistees beyond the 45-month point in their first-term. [Ref. 34] Appendix B lists the types of discharges categorized as "failure to

meet minimum behavioral or performance criteria." These discharges relate to an individual's inability to conform to the rules and regulations of the Marine Corps.

b. **"Other Than Unsuitability" Attrition.** Defined as individuals in the data set who serve less than four years on active duty and receive an ISC for reasons other than the categories "release from active service," "entry into officer programs," "death," and "failure to meet minimum behavioral or performance criteria." Appendix C lists the types of discharges that fall in this category.

c. **"Overall" Attrition.** Defined as individuals in the data set who serve less than four years on active duty and receive an ISC for reasons other than the categories "release from active service," "death," and "entry into officer programs." "Overall" attrition includes all ISCs listed in Appendices B and C.

2. Explanatory Variables

a. *Demographic Variables*

(1) **Age.** A continuous variable that indicates the individual's age at time of entry into the Armed Forces. The a priori hypothesis asserts that the older an individual is at entry, the less likely he is to attrite due to unsuitability. The maturation reform theory, which states that as an individual becomes older, he matures and becomes less involved in undesirable behavior, supports this hypothesis. [Ref. 35]

(2) **Gender.** A dichotomous variable. The base case is female. The a priori hypothesis states that if an individual is male, the probability of unsuitability attrition increases compared with females. Civilian crime statistics support this hypothesis. [Ref. 36]

(3) **Race.** A dummy variable defined by three variables. The base case is Caucasian. The three variables are: Afro-American, Hispanic, and Other Minority. Other minorities include American Indian, Alaskan Native, Asian, Pacific

Islander, and others. The a priori hypothesis maintains that if an individual falls into a minority category, the probability of unsuitability attrition is smaller than that for nonminorities. A minority's perception of fewer opportunities available to minorities in the civilian sector increases incentives to these individuals to succeed in the military.

(4) **Education**. A dichotomous variable. The base case is high school graduate. The variable non-high school graduate includes Tier 2 individuals (alternative credential holder) and Tier 3 individuals (non-high school graduate). Although Tier 2 individuals have obtained the same level of education as high school graduates, previous research shows the attrition pattern of Tier 2 individuals more closely resembles that of non-high school graduates. [Ref. 37] The a priori hypothesis states that if an individual did not graduate from high school, he is more likely to attrite for unsuitability. Generally, non-high school graduates may less readily conform to the strict rules and regulations governing military life, since they generally had difficulties conforming to the rules and regulations of high school. [Ref. 38]

(5) **AFQT Group**. A dummy variable defined by three variables, with the base case being Category I/II individuals. The three variables are: Category IIIA, Category IIIB, and Category IV. Table 2 shows the AFQT categories and their corresponding percentile scores. The Services do not accept Category V individuals. The percentile scores "reflect a person's trainability relative to that of the general youth population." [Ref. 39] The a priori hypothesis asserts that the lower an individual's AFQT category, the more likely he is to attrite for unsuitability. This hypothesis reflects the findings of criminologists regarding the link between criminality and low intelligence. [Ref. 40]

Table 2. AFQT Categories by Percentile Scores

AFQT Category	AFQT Percentile Score
I	93-99
II	65-92
IIIA	50-64
IIIB	31-49
IV	10-30
V	1-9

b. Moral Waiver Variables

The seven moral waiver variables follow the eight moral waiver codes in the MEPCOM files, with juvenile and adult felony combined into one variable. Individuals who do not receive a moral waiver at the time of accession are the base case.

(1) **Traffic.** The a priori hypothesis for the Marine Corps does not expect a traffic waiver to increase or decrease the probability of unsuitability attrition, as supported by previous empirical studies. [Ref. 41]

(2) **Less than three minor non-traffic offenses**

(3) **Three or more minor non-traffic offenses**

(4) **Misdemeanor**

(5) **Felony**

The a priori hypotheses expect moral waiver variables (2) through (5) to increase the probability of unsuitability attrition. The common cause model, which states the best predictor of current behavior is past behavior [Ref. 42], supports these

hypotheses. The past behavior of these individuals shows a disregard for society's expected behavior, and this attitude may continue.

(6) **Drug.** The a priori hypothesis expects a drug waiver to increase the probability of unsuitability attrition. Any drug use is grounds for an unsuitability discharge from the Marine Corps. A past drug user is more likely to use drugs while in the military than an individual without a history of drug use. The moral waiver code for drug use does not differentiate between an experimental user of marijuana and, for example, a cocaine user. Therefore, this hypothesis may not be equally applicable to all individuals with a drug waiver.

(7) **Alcohol.** The a priori hypothesis expects an alcohol waiver to increase the probability of unsuitability attrition. Recreational alcohol use is prevalent in the Service, and an individual with past alcohol abuse problems may be susceptible to relapse. Individuals are more likely to get in trouble if under the influence of alcohol because of impaired judgment.

This study analyzes the effects of the demographic variables (age, gender, race, education, and mental aptitude) and the moral waiver variables on attrition (unsuitability, "other than unsuitability," and "overall"). The next chapter uses distribution frequencies and various cross-tabulations to analyze the data.

IV. PRELIMINARY DATA ANALYSIS

This chapter analyzes the descriptive statistics of the data. It contains an examination of variable frequencies and designated variable cross-tabulations for individual Marine Corps and Navy cohorts. An extensive analysis is conducted of the Marine Corps statistics, followed by a general comparison between the Marine Corps and Navy statistics. Analyzing these statistics leads to valuable insights. However, conclusions cannot be accurately drawn from these descriptive statistics, because the variables analyzed are not isolated from the effects of other variables. Chapter V addresses this limitation through the use of regression analysis.

The number and percentage of attrition for each cohort, by Service, are shown in Table 3. The Marine Corps percentage of unsuitability attrition is fairly consistent across the cohorts. Cohort FY91 exhibits the smallest percentage, which could be the result of more quality accessions for that cohort, or more deployed time due to the drawdown, resulting in less time for getting into trouble. Unsuitability attrition accounts for approximately half of all attrition in the Marine Corps and approximately 60 percent of all attrition in the Navy. There may be several reasons for this difference between the Services: an overall higher percentage of quality accessions entering the Marine Corps; the Marine Corps' stricter indoctrination process where honor, courage, and commitment are stressed; differing leadership philosophies between the Services; or the rigorous physical training of all individual Marines, which can lead to an increase in medical discharges. As Table 4 shows, the Marine Corps has a substantially larger percentage of first-term, "other than unsuitability" attrition for medical reasons than the Navy. For example, in FY88, 77.80 percent of "other than unsuitability" attrition in the Marine Corps was for medical reasons, compared to 52.04 percent in the Navy.

Table 3. Attrition by Service and Cohort

	FY88		FY89		FY90		FY91	
Marine Corps	Number	Pct	Number	Pct	Number	Pct	Number	Pct
Unsuitability	5,670	16.53	5,286	16.46	5,449	17.00	4,389	15.57
Other than unsuitability	4,473	13.04	4,883	15.20	5,859	18.27	4,976	17.66
Overall	10,143	29.57	10,169	31.66	11,308	35.27	9,365	33.25
Navy								
Unsuitability	16,392	19.72	--	--	11,849 ^a	17.40 ^a	--	--
Other than unsuitability	10,858	13.36	--	--	6,502 ^a	9.54 ^a	--	--
Overall	27,250	33.08	--	--	18,351 ^a	26.94 ^a	--	--

^aNumber and percentage are based on three years, which will cause underestimation.

Table 4. "Other Than Unsuitability" Medical Attrition by Service and Cohort

	FY88	FY89	FY90	FY91
Service	Pct	Pct	Pct	Pct
Marine Corps	77.80	73.79	82.88	74.18
Navy	52.04	--	34.30 ^a	--

^aPercentage is based on three years, which will cause underestimation.

Table 5 is a distribution frequency of the explanatory variables for each Marine Corps cohort. The table shows that the mean age of accessions and the mix of male and female accessions remain constant over the cohorts. The mix of race remains relatively constant for cohorts FY88 thru FY90. In FY91 the percentage of

**Table 5. Distribution Frequency of Explanatory Variables
for the Marine Corps**

	FY88		FY89		FY90		FY91	
	Number	Pct	Number	Pct	Number	Pct	Number	Pct
<u>Age at Entry</u>								
Mean	19.02		18.92		19.04		19.24	
<u>Gender</u>								
Male	32,250	94.03	30,067	93.62	30,346	94.64	26,619	94.47
Female	2,048	5.97	2,050	6.38	1,715	5.35	1,557	5.53
<u>Race</u>								
White	24,428	71.22	22,982	71.56	22,631	70.59	20,898	74.17
Black	6,273	18.29	5,688	17.71	5,645	17.61	3,977	14.11
Hispanic	2,478	7.22	2,385	7.43	2,706	8.44	2,358	8.37
Other Minority	1,119	3.26	1,062	3.30	1,079	3.36	943	3.35
<u>Education</u>								
High School Graduate	32,661	95.23	30,191	94.00	29,820	93.01	26,917	95.53
Non-High School Graduate	1,637	4.77	1,962	6.00	2,241	6.99	1,256	4.47
<u>AFOT Category</u>								
Category I	1,148	3.35	1,030	3.21	959	2.99	944	3.35
Category II	11,973	34.91	11,038	34.37	10,650	33.22	9,928	35.24
Category IIIA	9,857	28.74	9,277	28.89	9,432	29.42	8,380	29.74
Category IIIB	11,238	32.77	10,641	33.13	10,812	33.72	8,890	31.55
Category IV	82	.24	131	.42	208	.65	34	.12
<u>Moral Waiver</u>								
Traffic	3,438	10.02	4,574	14.24	4,524	14.11	3,996	14.18
Less than 3 MNTR	932	2.72	900	2.80	1,041	3.25	1,531	5.43
3 or more MNTR	173	.50	163	.51	165	.51	313	1.11
Misdemeanor	1,181	3.44	1,238	3.85	1,543	4.81	1,035	3.67
Felony	535	1.56	479	1.49	588	1.83	661	2.35
Drug	13,902	40.53	12,143	37.81	11,723	36.56	9,055	32.14
Alcohol	406	1.18	424	1.32	477	.15	562	1.99
Total	20,479	59.71	19,780	61.59	19,896	62.06	17,153	60.88

^aPercentage totals may not equal due to rounding.

Caucasians increased by approximately 3 percent, while the percentage of African-Americans decreased by approximately 3 percent. This shift in racial mix may be caused by the "benefit versus burden of military service" concept coming into play during Desert Storm. This concept deals with equity of social representation within the Armed Forces. During armed conflict, some minority leaders raise the issue of "numerical fairness" and suggest that minorities shoulder a disproportionate burden of war because they are over represented in the Armed Forces. [Ref. 43] This occurred during Desert Storm, when some African-American leaders voiced their concerns about the over representation of African-Americans in the Armed Forces.

As discussed previously, the supply pool is shrinking due to the decreasing propensity to enlist. The percentage of high school graduate accessions shows a decreasing pattern up to FY91, when the fever of patriotism during Desert Storm caused an increase in the supply. Less than 1 percent of Marine Corps recruits are Category IV individuals, resulting in a small sample size for each cohort. When a sample size is small, the results of the cross-tabulations and regression models are less precisely measured.

Approximately 60 percent of all accessions receive a moral waiver. Although this is a high percentage, two waiver categories, traffic and preservice drug use, comprise approximately 80 percent of these waivers for each cohort. Marine Corps policy is strict concerning these two waivers. The Marine Corps requires a drug waiver for previous experimental or casual use of marijuana, which is a common behavior of today's youth. However, the percentage of drug waivers declines steadily from FY88 to FY91, perhaps due to increased drug education. Likewise, the propensity to commit traffic violations is very high within the recruited age group, leading to a high numbers of waivers.

Four moral waiver variables are associated with past criminal behavior: less than three minor non-traffic offenses, three or more minor non-traffic offenses, misdemeanor, and felony. Only a small percentage of waivers were granted for three or more minor non-traffic offenses (.51 percent of all FY89 accessions), which may be attributed to the Marine Corps' unwillingness to accept personnel with a pattern of unacceptable behavior. The numbers represent a small sample size, and can lead to less precise results in the cross-tabulations and regression models.

Marine Corps policy attempts to differentiate between patterns of criminal behavior and lapses of judgment common to the recruited age group. A high percentage of waivers are granted in the less than three minor non-traffic and misdemeanor categories, compared to three or more minor non-traffic offenses. An individual can have up to five misdemeanors and be granted a moral waiver. The data base only records a misdemeanor waiver, not the number of misdemeanors. It may be that most accessions receiving this waiver have less than three misdemeanors, which would explain the high percentages in the two categories. The similar percentages of waivers granted for misdemeanors (4.81 percent of all FY90 accessions) and less than three minor non-traffic offenses (3.25 percent of all FY90 accessions) support this hypothesis.

The Marine Corps grants a surprising number of moral waivers each year for felonies. Although it represents a small percentage, the Marine Corps accesses approximately 500 convicted felons each year. These are serious offenses that cannot be excused as typical "youth mischief."

Table 6 is a distribution frequency of the explanatory variables for the Navy cohorts. When comparing Navy and Marine Corps frequency tables, consideration needs to be given to the number of accessions required by each Service, the type of individual each service attracts, and the function of each Service. The Navy requires

over twice as many accessions each year as the Marine Corps. The declining propensity to enlist creates competition for this supply, not only between the Marine Corps and Navy, but among the other Services as well.

Table 6. Distribution Frequency of Explanatory Variables for the Navy

	FY88		FY90	
	Number	Pct	Number	Pct
<u>Age at Entry</u>				
Mean	19.72		19.67	
<u>Gender</u>				
Male	72,977	88.61	60,344	88.62
Female	9,378	11.39	7,752	11.38
<u>Race</u>				
White	57,149	69.39	45,832	67.30
Black	16,547	20.09	13,871	20.37
Hispanic	5,890	7.15	6,210	9.12
Other Minority	2,769	3.37	2,183	3.21
<u>Education</u>				
High School Graduate	74,987	91.05	61,188	89.86
Non-High School Graduate	7,386	8.95	6,908	10.14
<u>AFQT Category</u>				
Category I	4,004	4.86	2,957	4.34
Category II	27,588	33.50	23,567	34.61
Category IIIA	18,450	22.40	16,810	24.69
Category IIIB	24,527	29.78	20,140	29.58
Category IV	7,786	9.46	4,622	6.79
<u>Moral Waiver</u>				
Traffic	369	.45	376	.55
Less than 3 MNTR	6,796	8.25	956	1.40
3 or more MNTR	463	.56	227	.33
Misdemeanor	8,589	10.43	6,942	10.19
Felony	179	.22	121	.18
Drug	3,208	3.90	4,008	5.89
Alcohol	453	.55	670	.98
Total	19,884	24.14	12,963	19.04

^aPercentage totals may not equal due to rounding.

Some differences between the Services are shown in the control variables. The Navy has a higher percentage of female accessions, by approximately 6 percentage points. This can be explained by the Marine Corps' warfighter image (i.e., every Marine is a rifleman), and the greater availability of traditionally female jobs in the Navy. The Navy has a larger percentage of black accessions, perhaps because the Navy offers more opportunity for technical training. The Marine Corps has a higher percentage of accessions that are high school graduates, which may be due to the smaller number of accessions required relative to the available supply. The Navy has a larger percentage of AFQT Categories I and IV accessions. The Navy's vast number of technical fields is appealing to Category I personnel, while the larger number of accessions needed requires the Navy to access more Category IV individuals.

The Navy and Marine Corps differ significantly in the percentage of accessions who receive traffic and drug waivers. This difference is attributed to the disparity between the Services in the criteria for granting these waivers, as discussed in Chapter II. The Navy, like the Marine Corps, has a small percentage of accessions who receive a moral waiver for three or more non-traffic offenses. Like the Marine Corps, this can be attributed by the Navy's reluctance to allow individuals with a pattern of behavior problems into their ranks.

The Navy has a higher percentage of accessions with a misdemeanor waiver, which could be supply driven. The Navy has a much smaller percentage of accessions with felony moral waivers. The Marine Corps may be more willing to allow these individuals a second chance.

Table 7 shows the percentage of Marine Corps accessions who receive a moral waiver, by cohort, and demographic variable. The percentage of females receiving a moral waiver is considerably smaller than that of males. This can be explained by the fact that males are more likely to be involved in criminal activity. [Ref. 44] The

percentage of whites who receive a moral waiver is greater than any other race, compared to blacks, who, as a group, receive the smallest percentage of moral waivers. The reasons for this are not clear, although Flyer (1995) observed that blacks are somewhat more concerned than others about being rejected for military service and may be more reluctant to admit past behavior.

Table 7. Percentage of Moral Waivers by Demographic Variable for the Marine Corps

	FY88	FY89	FY90	FY91
	Pct	Pct	Pct	Pct
All Accessions	59.71	61.59	62.06	60.88
<u>Gender</u>				
Male	60.78	62.75	63.00	61.97
Female	42.92	44.49	45.42	42.13
<u>Race</u>				
White	63.03	64.97	65.74	64.49
Black	48.43	50.02	48.56	44.58
Hispanic	56.13	56.06	59.90	57.59
Other Minority	58.27	62.71	60.89	57.79
<u>Education</u>				
High School Graduate	59.26	61.12	61.45	60.56
Non-High School Graduate	68.66	68.95	70.19	67.67
<u>AFQT Category</u>				
Category I	58.10	62.23	64.03	63.98
Category II	60.49	62.44	62.20	61.39
Category IIIA	58.79	60.49	62.18	60.72
Category IIIB	59.89	61.69	61.83	60.25
Category IV	54.88	54.20	51.92	29.41

Non-high school graduates, as a group, receive a larger percentage of moral waivers than high school graduates, while the AFQT groups (excluding Category IV personnel due to sample size limitations) receive moral waivers at about the same rate. Previous research shows that there is a strong relationship between these two variables, and behavior and performance in the military. [Ref. 45] Since this relationship is well known, one would expect it to be more difficult for a non-high school graduate and/or lower AFQT category individual to be granted a moral waiver. However, these cross-tabulations do not support this reasoning.

Table 8 shows the percentage of Navy accessions who receive a moral waiver, by cohort and demographic variable. In making comparisons between the Navy and Marine Corps, consideration needs to be given to the fact that the Marine Corps' stricter criteria for requiring drug and traffic waivers result in a larger percentage of accessions receiving moral waivers. The Navy follows a pattern similar to that of the Marine Corps regarding the sex, race, and education variables. Males, as a group, receive a larger percentage of moral waivers than females; whites, as a group, receive a larger percentage than other races; blacks, as a group, receive a smaller percentage than other races; and non-high school graduates, as a group, receive a larger percentage than high school graduates. The main difference between the two Services is in the AFQT categories. The Navy follows the expected pattern for AFQT category, with Category I, as a group, receiving the largest percentage of moral waivers, and with that percentage decreasing with each subsequent category.

Table 9 shows the Marine Corps percentage of unsuitability attrition, by cohort, for the explanatory variables. In analyzing the percentage of unsuitability attrition between cohorts, the percentage of overall unsuitability attrition for each cohort must be taken into account. For example, FY90 shows an unsuitability attrition rate of 17 percent for the whole sample, while the FY91 unsuitability attrition

rate is 15.57 percent for the whole sample. Generally, this results in a lower percentage of unsuitability attrition by explanatory variable for the FY91 cohort compared to the FY90 cohort.

Table 8. Percentage of Moral Waivers by Demographic Variable for the Navy

	FY88	FY90
	Pct	Pct
All Accessions	24.14	19.04
<u>Gender</u>		
Male	30.28	20.26
Female	11.53	9.51
<u>Race</u>		
White	27.47	21.88
Black	14.25	11.83
Hispanic	22.84	16.28
Other Minority	14.45	14.89
<u>Education</u>		
High School Graduate	23.03	17.94
Non-High School Graduate	35.45	28.73
<u>AFQT Category</u>		
Category I	29.22	22.12
Category II	27.55	22.65
Category IIIA	26.64	20.48
Category IIIB	19.93	14.80
Category IV	16.83	11.86

**Table 9. Percentage of Unsuitability Attrition by Explanatory
Variable for the Marine Corps**

	FY88	FY89	FY90	FY91
	Pct	Pct	Pct	Pct
All Accessions	16.53	16.46	17.00	15.57
<u>Gender</u>				
Male	16.57	16.50	17.15	15.45
Female	15.97	15.90	14.29	17.79
<u>Race</u>				
White	16.72	16.40	17.12	15.42
Black	18.14	18.58	17.80	17.73
Hispanic	10.94	12.37	14.08	12.43
Other Minority	15.73	15.44	17.52	17.18
<u>Education</u>				
High School Graduate	15.93	15.63	16.11	15.01
Non-High School Graduate	28.47	29.39	28.78	27.72
<u>AFQT Category</u>				
Category I	11.15	11.36	12.72	11.76
Category II	14.86	15.30	14.96	13.67
Category IIIA	16.98	16.60	17.11	16.26
Category IIIB	18.41	18.02	19.38	17.47
Category IV	24.39	17.56	25.48	15.15
<u>Moral Waiver</u>				
No Moral Waiver	14.81	14.39	14.53	14.38
All Moral Waivers	17.70	17.75	18.50	16.35
Traffic	15.68	14.36	14.85	12.46
Less than 3 MNTR	19.53	18.22	17.58	17.57
3 or more MNTR	16.76	20.86	15.76	11.82
Misdemeanor	20.66	18.01	18.73	16.23
Felony	21.87	21.50	21.26	18.15
Drug	17.59	18.78	19.88	17.82
Alcohol	18.97	16.51	19.71	17.44

Males, as a group, have a higher percentage of unsuitability attrition than females in FY88-FY90, but FY91 shows a reversal of this trend. The reasons for the reversal are unknown. Blacks, as a group, have a higher percentage of unsuitability attrition than any other race, while Hispanics, as a group, have the lowest percentage. Non-high school graduates, as a group, have a rate of unsuitability attrition that is more than 12 percent higher than high school graduates, possibly because non-high school graduates are less inclined to follow rules and regulations. The percentage of unsuitability attrition increases the lower the AFQT category. A possible explanation for this pattern is that the lower the AFQT category (i.e., the less trainable an individual), the more likely an individual is to have difficulties interpreting the rules. Category IV is not included in this analysis because of the small sample size.

A comparison of the rate of unsuitability attrition between individuals who receive a moral waiver and individuals who do not receive a moral waiver shows that individuals who do not receive a moral waiver, as a group, have a smaller percentage of unsuitability attrition. With regard to the specific types of moral waivers, Table 9 shows that individuals who receive a traffic waiver, as a group, have a smaller percentage of unsuitability attrition than any other group that receives a moral waiver, and have a smaller percentage than the sample as a whole. This supports previous research which shows that, for the Marine Corps, traffic waivers have no relationship to unsuitability attrition. The moral waiver categories associated with previous criminal behavior, as groups, generally show an unsuitability attrition rate higher than that of the overall sample. Across the cohorts, felony, as a group, shows the largest percentage of unsuitability attrition.

The Navy's percentage of unsuitability attrition for the explanatory variables for cohort FY88 is shown in Table 10. Since the Navy FY90 cohort does not contain four years of data, the FY88 Navy and Marine Corps cohorts will be compared. The

Navy, as a whole, has 3 percent more unsuitability attrition than the Marine Corps. Thus, the attrition by explanatory variable is expected to be higher for the Navy. Like the Marine Corps, males, as a group, show a higher rate of unsuitability attrition than

Table 10. Percentage of Unsuitability Attrition by Explanatory Variables for the Navy

	FY88
	Pct
All Accessions	19.90
<u>Gender</u>	
Male	20.63
Female	14.28
<u>Race</u>	
White	19.52
Black	22.22
Hispanic	19.41
Other Minority	15.06
<u>Education</u>	
High School Graduate	17.98
Non-High School Graduate	39.50
<u>AFQT Category</u>	
Category I	13.81
Category II	17.56
Category IIIA	23.10
Category IIIB	19.69
Category IV	24.45
<u>Moral Waiver</u>	
No Moral Waiver	18.29
All Moral Waivers	24.96
Traffic	22.22
Less than 3 MNTR	23.81
3 or more MNTR	28.08
Misdemeanor	27.24
Felony	21.79
Drug	22.23
Alcohol	20.31

females. However, the percentage difference between these variables is considerably larger for the Navy. For the race variable, blacks, as a group, have the largest percentage of unsuitability attrition for both Services. The smallest percentage of unsuitability attrition by race variable is other minority for the Navy, whereas it is Hispanics for the Marine Corps. The racial composition of the other minority variable is quite different between the Services and may account for these findings. The education and AFQT categories follow the pattern displayed by the Marine Corps, except Category IIIA. For the Navy, Category IIIA is higher than Category IIIB.

Like the Marine Corps, individuals who do not receive a moral waiver, as a group, attrite due to unsuitability less frequently than those who receive a moral waiver. All the moral waiver variables, as groups, had a higher percentage of unsuitability attrition than the cohort as a whole. These results follow a pattern similar to the Marine Corps, except the traffic variable, which was lower than the cohort as a whole for the Marine Corps. This difference can be attributed to the different criteria for requiring a traffic waiver between the Services. For the Navy, felony moral waivers, as a group, had the smallest percentage of unsuitability attrition, although these results may be affected by the small sample size. In the Marine Corps, the result was the exact opposite. The Navy may screen a felon's other enlisted criteria more carefully than the Marine Corps.

Table 11 shows the Marine Corps percentage of individuals who attrite for unsuitability and had a moral waiver, by selected ISCs. Those ISCs having no or very few observations are excluded. The table shows that, for most of the discharges, the percentage of individuals who receive these discharges is higher than the overall percentage of individuals who entered the Marine Corps with a moral waiver. Individuals who entered the Marine Corps with a moral waiver received over 70 percent of the discharges for alcoholism, drugs, and fraudulent enlistment, showing

**Table 11. Percentage of Unsuitability Discharge with
a Moral Waiver for the Marine Corps**

	FY88	FY89	FY90	FY91
	Pct	Pct	Pct	Pct
All Accessions	59.71	61.59	62.06	60.88
Behavior Disorder	58.00	59.07	66.08	61.76
Alcoholism	77.66	75.53	79.92	78.53
Discreditable Incidents	67.24	68.13	65.42	64.40
Drugs	81.02	80.06	79.15	79.30
Civil Court Conviction	66.67	72.22	64.71	72.73
Court Martial	65.48	71.38	66.74	69.23
Fraudulent Entry	72.13	76.30	76.05	66.71
Good of Service (in lieu of Court Martial)	64.80	65.57	66.07	67.56
Misconduct	56.79	60.56	50.85	50.00
Pattern of Minor Disciplinary Infractions	66.67	63.56	61.19	55.51
Commission of Serious Offense	59.77	63.74	76.04	76.92
Trainee Discharge	55.78	59.12	58.38	52.96

a pattern between moral waivers and these discharges. A fraudulent enlistment discharge is given to a Marine who deliberately omitted or concealed facts, which, if known at the time, would have rendered him ineligible for enlistment. An individual receives a trainee discharge if he is separated in his initial training (i.e., boot camp) for lack of effort, incapability, or failure to adapt to the Marine Corps environment. The percentage of individuals who receive a moral waiver and are discharged for this

reason is lower than the percentage of the sample that received a moral waiver. This could be because the controlled environment of boot camp allows little opportunity for unfavorable behavior.

Table 12 shows the Navy percentage of individuals who attrite for unsuitability and had a moral waiver, by selected ISCs for cohort FY88. Cohort FY90 is not used because it contains only three years of observations. In comparing the Services, consideration needs to be given to the different percentages of moral waivers granted between the two Services. The Navy follows the Marine Corps pattern in that, for most of these discharges, the percentage of individuals receiving them is greater than the percentage of the sample size receiving a moral waiver at accession. The percentage of individuals who receive a trainee discharge is also smaller than the sample size of those who receive a moral waiver at entry, due to the controlled environment.

Table 12. Percentage of Unsuitability Discharge with a Moral Waiver for the Navy

	FY88
	Pct
All Accessions	24.14
Behavior Disorder	24.57
Alcoholism	38.33
Discreditable Incidents	31.44
Drugs	41.75
Civil Court Conviction	30.69
Court Martial	36.29
Fraudulent Entry	34.72
Good of Service (in lieu of Court Martial)	31.93
Misconduct	36.00
Pattern of Minor Disciplinary Infractions	29.41
Commission of Serious Offense	34.27
Trainee Discharge	19.63

The results of the cross-tabulations presented in this chapter show that:

1. Unsuitability attrition accounts for at least 50 percent of all first-term, non-EAS attrition in both the Marine Corps and Navy.
2. For the Marine Corps, medical discharges account for over 75 percent of first-term, non-EAS "other than unsuitability" attrition.
3. Males, as a group, receive a higher percentage of moral waivers and attrite for unsuitability at a higher rate than females.
4. Whites, as a group, receive a higher percentage of moral waivers than any other race, but blacks, as a group, attrite for unsuitability at a higher rate.
5. Non-high school graduates, as a group, receive a higher percentage of moral waivers and attrite for unsuitability at a higher rate than high school graduates.
6. Individuals who receive a moral waiver other than a traffic waiver, as a group, attrite for unsuitability at a higher rate than individuals who do not receive a moral waiver.

These statistics can provide some valuable insight into the relationship between moral waivers and unsuitability attrition. However, cross-tabulations can lead to inaccurate conclusions because they do not control for all the explanatory variables simultaneously. To determine if there is a relationship between the explanatory variables and unsuitability attrition, a regression model must be employed. The regression models are the focus of the next chapter.

V. MULTIVARIATE ANALYSIS

This chapter analyzes the results of the regression models for unsuitability attrition, "other than unsuitability" attrition, and "overall" attrition, and compares the results among these three models. A regression model estimates the effect of each explanatory variable on the dependent variable while holding all other explanatory variables constant. For example, in the previous section, individuals who receive a felony moral waiver, as a group, have the highest percentage of unsuitability attrition. This result did not take into consideration the individual's other characteristics that contribute to unsuitability attrition, such as being a non-high school graduate. The regression model measures the effects of the felony moral waiver isolated from the effects of the other explanatory variables.

A binary logistic (logit) regression model employing maximum-likelihood techniques is used in this chapter to determine the probability of first-term, non-EAS unsuitability, "other than unsuitability", and "overall" attrition. This model is appropriate since the dependent variables are dichotomous - those who attrite and those who do not. The basic assumption in this model is that the log of the odds of belonging to a population (attrition) is related to the explanatory variables, that is, how the log of the odds in favor of attriting change as the explanatory variables change. [Ref 46] The logit model for predicting the probability of attrition is:

$$Pr(Y=1) = \frac{1}{1 + \exp [-(\beta_0 + \beta_i X_i)]} \quad (5.1)$$

where Y is the probability of the outcome (attrition), β s are the parameter estimates and Xs are the explanatory variables.

The model is applied to the four Marine Corps cohorts combined. Additionally, the model is used for each Marine Corps and Navy cohort independently to account for factors such as supply, policy, and societal values, which change over time.

The results of the model are interpreted using the predicted probability method. The logit model calculates parameter estimates for each explanatory variable that show the change in the log of the odds of attriting. To convert this into a predicted probability, which is easier to understand, the parameter estimate of each variable is multiplied by $P(1-P)$, where P is the base probability of attriting. [Ref. 47] For a continuous variable, this conversion gives the direct change in the probability of attriting given a one unit change in the explanatory variable. For a dichotomous or dummy variable, the direct change in the probability is compared to the base case of that variable. The predicted probabilities can be applied to groups as a whole, not to individuals within the groups.

The relationship between each explanatory variable and the dependent variable is determined by the level of significance. The most widely accepted level of significance is 5 percent, although the level is subjective, and is set by the analyst. If the explanatory variable is significant at the 5 percent level, five times out of 100 this relationship is due to chance. For the tables presented in this chapter, the explanatory variables that are significant at the 1, 5, and 10 percent levels are identified.

Table 13 contains a description of the variables used in the logit models.

Table 13. Description of Variables

<u>Dependent Variables</u>	<u>Description</u>
Unsuitability Attrition	ISCs 60 - 87 (Appendix B)
Other than Unsuitability Attrition	ISCs 10- 22 and 90 - 99 (Appendix C)
Overall Attrition	ISCs 10 22, 60 - 87, and 90 - 99 (Appendices B & C)
<u>Explanatory Variables</u>	
<u>Demographic</u>	
Age_entr	Age at entry into the Armed Forces (Base case is female)
Gender	Male
Male	(Base case is Caucasian)
Race	African-American
Black	Spanish Origin
Hispanic	Native American, Asian, Pacific Islander, Alaskan
OTHMIN	Native
Education	(Base case is High School Graduate)
NONHSG	Non-High School Graduate
AFQT Category	(Base case is Category I/II)
CATIIIA	Category IIIA
CATIIIB	Category IIIB
CATIV	Category IV
<u>Moral Waiver</u>	(Base case is no moral waiver at accession)
Traffic	Traffic waiver at accession
MNTRL3	Less than 3 minor non-traffic offenses waiver
MNTR3M	3 or more minor non-traffic offenses waiver
MSDMR	Serious offense for Marine Corps and Misdemeanor
	Offense for Navy waiver
Felony	Felony waiver
Drug	Preservice drug waiver
Alcohol	Preservice alcohol waiver

A. UNSUITABILITY ATTRITION MODEL AND RESULTS

This section examines the effects of the explanatory variables on unsuitability attrition in the Marine Corps by combined and individual cohorts. The model uses equation (5.1) where Y is unsuitability attrition and the Xs are the demographic variables (age at entry, gender, education, and AFQT category) and the moral waiver

variables (traffic, MNTRL3, MNTR3M, MSDMR, felony, drug, and alcohol). These results are compared with the results of the Navy unsuitability attrition model, and the differences and similarities are analyzed.

Table 14 shows the predicted probability of unsuitability attrition for the explanatory variables with the Marine Corps cohorts combined. Most of the explanatory variables are significant at the 1 percent level, which means only one time out of a hundred these relationships are due to chance.

Table 14. Predicted Probability of Unsuitability Attrition for Marine Corps Cohorts Combined

Variable	Predicted Probability
<u>Demographic</u>	
Age_entr	.71*
Male	-.94**
Black	.94*
Hispanic	-4.88*
OTHMIN	-.57
NONHSG	10.05*
CATIIIA	2.29*
CATIIIB	3.95*
CATIV	7.41*
<u>Moral Waiver</u>	
Traffic	-.29
MNTRL3	3.45*
MNTR3M	.75
MSDMR	3.43*
Felony	5.35*
Drug	3.63*
Alcohol	3.27*
<u>Fiscal Year</u>	
FY88	.83*
FY89	.74**
FY90	1.03*

* significant at .01

** significant at .05

*** significant at .10

Of the demographic variables, education has the greatest impact on unsuitability attrition. Being a non-high school graduate increases the probability by more than 10 percentage points. AFQT category is also strongly related to unsuitability attrition. The three AFQT variables are significant and increase the probability of attriting for unsuitability, with a greater probability the lower the AFQT category. Being Hispanic decreases the probability compared to whites, as was expected. However, being black increases the probability compared to whites, contrary to the a priori hypothesis. The result of the other minority variable is insignificant. The result of the gender variable is surprising. Males are less likely to attrite for unsuitability than females, which contradicts the a priori hypothesis. Age at entry increases the probability of unsuitability attrition, which is another unexpected result.

Table 14 clearly demonstrates that there is a relationship between moral waivers and unsuitability attrition. Five of the seven moral waiver variables increase the probability of unsuitability attrition, with a felony having the greatest impact. Individuals receiving felony moral waivers were more than 5 percentage points more likely to attrite for unsuitability than individuals who did not receive a moral waiver. Moral waivers for less than three minor non-traffic offenses, misdemeanor, drug, and alcohol also have a significant impact. A waiver for three or more minor non-traffic offenses shows no relationship to unsuitability attrition. Perhaps these individuals, who have an established pattern of criminal behavior, are more closely scrutinized in the screening process. As expected, traffic waivers are insignificant.

A fiscal year explanatory variable was added for the combined cohorts to determine if there are differences in the probability of attriting for unsuitability among individual cohorts. The base case is FY91 because in many of the cross tabulations the results of this cohort do not follow the patterns established by the other cohorts.

Table 14 shows that individuals in cohorts FY88 thru FY90 have a greater probability of attriting for unsuitability compared to FY91. Until data on future cohorts become available, it cannot be determined whether FY91 is the beginning of a different pattern or an anomaly. It is possible these differences can be attributed to changes in the philosophy of the Commanders who initiate unsuitability discharges or changes in societal values.

Table 15 shows the predicted probability of unsuitability attrition for each explanatory variable, by individual Marine Corps cohort. The results are consistent with those of the cohorts combined, except for the male, black, and Category IV variables. The variables male and black are significant when the cohorts are combined, but are not significant for the majority of the individual cohorts. The strength of these variables for certain individual cohorts influences the results when the cohorts are combined, causing inconclusive results.

The AFQT variable Category IV is not significant for the majority of cohorts, but is significant for the cohorts combined. When the Category IV variable is analyzed for individual cohorts, the small sample size can lead to inconclusive results because of the relatively large standard errors. Combining the cohorts allows a large enough sample size to draw the conclusion that if an individual is a Category IV, it increases the probability of attriting for unsuitability.

Table 16 shows the predicted probability of unsuitability attrition for the explanatory variables for Navy cohorts FY88 and FY90. Since FY90 only contains data for three years, the predicted probability results will not give the true effect when compared to the other cohort. However, since a small percentage of attrition takes place over the fourth year, the predicted probabilities can be used to determine if the variable is significant and the direction (increase/decrease) of the effect on the probability. In comparing the Marine Corps with the Navy, consideration should be

given to the higher rate of unsuitability attrition in the Navy, and the possible differences in philosophy between the Services in initiating unsuitability discharges.

**Table 15. Predicted Probability of Unsuitability Attrition
by Marine Corps Cohort**

Variable	FY88	FY89	FY90	FY91
<u>Demographic</u>				
Age_entr	.83*	.68*	.80*	.59*
Male	-1.01	-.67	1.34	-3.46*
Black	.58	1.71*	.09	1.63**
Hispanic	-7.90*	-4.66*	-3.74*	-4.00*
OTHMIN	-1.92***	-1.59	-.46	1.83
NONHSG	10.39*	10.69*	10.00*	10.28*
CATIIIA	2.75*	1.46*	2.55*	2.70*
CATIIIB	4.44*	2.81*	4.86*	4.12*
CATIV	9.86*	2.69	10.59*	2.36
<u>Moral Waiver</u>				
Traffic	.73	-.07	.24	-2.03*
MNTRL3	4.44*	3.60*	3.08*	3.09*
MNTR3M	1.65	5.36**	1.17	-3.20
MSDMR	5.16*	3.24*	3.72*	1.91
Felony	6.18*	6.38*	6.46*	3.29**
Drug	2.66*	4.05*	4.99*	3.38*
Alcohol	3.42***	1.97	4.89*	3.01**

* significant at .01

** significant at .05

*** significant at .10

Table 16. Predicted Probability of Unsuitability Attrition by Navy Cohort

Variable	FY88	FY90 ^a
<u>Demographic</u>		
Age_entr	.17*	.17*
Male	3.79*	4.89*
Black	2.35*	-.98*
Hispanic	-2.39*	-2.27*
OTHMIN	-4.92*	-6.93*
NONHSG	17.50*	14.96*
CATIIIA	3.76*	3.33*
CATIIIB	5.13*	5.22*
CATIV	9.01*	8.89*
<u>Moral Waiver</u>		
Traffic	3.71**	-.01
MNTRL3	4.65*	6.33*
MNTR3M	7.66*	4.40**
MSDMR	6.93*	5.52*
Felony	2.38	8.11*
Drug	4.44*	5.74*
Alcohol	1.93	1.77

* significant at .01

** significant at .05

*** significant at .10

^a contains only three years of data

Like the Marine Corps, non-high school graduates have the highest probability of unsuitability attrition, with the effect being considerably greater for the Navy. Moral waiver variables such as less than three minor non-traffic offenses, misdemeanor, and drug, affect unsuitability attrition in a pattern similar to the Marine Corps.

Differences between the Services are seen in other variables. For the Navy, the male variable is significant and increases the probability of unsuitability attrition, as suggested by the a priori hypothesis, whereas this variable is inconclusive for the

Marine Corps. The black variable, while inconclusive for the Marine Corps, is significant for both Navy cohorts, but the signs are opposite. A conclusion cannot be drawn for this variable without comparing more Navy cohorts. The other minority variable is significant for both Navy cohorts, and decreases the probability of unsuitability attrition compared to whites. This variable is insignificant for the Marine Corps. The difference in results could be due to the composition of races within the other minority variable. Asians, who have a relatively low attrition rate overall, account for 75 percent of the other minorities in the Navy, compared to 40 percent in the Marine Corps.

The Navy's variable three or more minor non-traffic offenses is significant in the direction of the a priori hypothesis, but is inconclusive in the Marine Corps, possibly due to the small sample size. The felony variable, while significant for the Marine Corps, has mixed results for the two Navy cohorts: significant in FY90, and inconclusive in FY88, due to insufficient sample size.

B. "OTHER THAN UNSUITABILITY" ATTRITION MODEL AND RESULTS

This section analyzes the results of the "other than unsuitability" attrition model. The model uses equation (5.1) where Y is "other than unsuitability" attrition and the Xs are the demographic variables (age at entry, gender, race, education, and AFQT category) and the moral waiver variables (traffic, MNTRL3, MNTR3M, MSDMR, felony, drug, and alcohol). The results of this model are compared with the results of the Marine Corps unsuitability attrition model to determine the similarities and differences. Next, a comparison is made between the Marine Corps and Navy results of the "other than unsuitability" attrition model.

Table 17 shows the predicted probabilities for the explanatory variables for "other than unsuitability" attrition in the Marine Corps for each individual cohort.

**Table 17. Predicted Probability of "Other than Unsuitability"
Attrition by Marine Corps Cohort**

Variable	FY88	FY89	FY90	FY91
<u>Demographic</u>				
Age_entr	.82*	.89*	.76*	.75*
Male	-15.50*	-15.78*	-16.90*	-15.50*
Black	-2.04*	-.42	-1.55*	-2.96*
Hispanic	-5.17*	-5.71*	-8.59*	-6.86*
OTHMIN	-5.58*	-4.52*	-7.96*	-4.75*
NONHSG	1.91**	2.27*	3.02*	1.40
CATIIIA	1.27*	1.88*	1.72*	2.81*
CATIIIB	1.67*	1.94*	4.52*	4.49*
CATIV	-6.93	-2.61	6.25**	2.77
<u>Moral Waiver</u>				
Traffic	.22	.55	.65	-.36
MNTRL3	-2.14***	-.66	1.58	-2.10**
MNTR3M	-.60	-3.41	-.43	1.47
MSDMR	-1.15	-.91	-.65	-2.09
Felony	-2.65	-.04	-1.98	.22
Drug	-1.31*	-1.02**	-.86**	-1.21**
Alcohol	1.00	-1.24	-5.64*	-5.62*

* significant at .01

** significant at .05

*** significant at .10

The results of some of the demographic variables are different from those in the unsuitability model. Males are 15.50 percent less likely to attrite for "other than unsuitability" than females, but males are not less likely to attrite for unsuitability. This may be explained by the fact that approximately 77 percent of "other than unsuitability" attrition is for medical reasons. Female Marines participate in the same physical training as males, and are generally more prone to injury. Additionally, discharges that apply primarily to females, such as pregnancy, parenthood, and marriage, are included in the "other than unsuitability" category. Blacks are less

likely than whites to attrite for "other than unsuitability," but are not less likely to attrite for unsuitability. Although non-high school graduates are also more likely to attrite for "other than unsuitability" than high school graduates, the impact of the difference is much greater for unsuitability attrition.

Except for the drug variable, the moral waiver variables are insignificant for "other than unsuitability" attrition. If a person has a drug waiver, it decreases the probability of attriting for "other than unsuitability" when compared to an individual who does not receive a moral waiver. This relationship is exactly opposite for unsuitability attrition. Since "other than unsuitability" attrition consists primarily of medical discharges, moral waivers were not expected to have an effect.

These results are consistent with the hypothesis that moral waivers have no relationship to "other than unsuitability" attrition. However, the results show a direct link between moral waivers and unsuitability attrition.

Table 18 shows the predicted probabilities for the explanatory variables for "other than unsuitability" attrition in the Navy for cohorts FY88 and FY90. A comparison of the control variables between the two Services shows that the Navy follows the same pattern as the Marine Corps. The main difference among the moral waiver variables involves the drug variable. In the Navy, if an individual has a drug waiver, it increases the probability of "other than unsuitability" attrition, whereas in the Marine Corps, it decreases the probability. Otherwise, the few moral waiver variables that are significant for the Navy cohorts decrease the probability of "other than unsuitability" attrition.

C. "OVERALL" ATTRITION MODEL AND RESULTS

This section examines the effects of the explanatory variables on "overall" attrition. The model uses equation (5.1) where Y is "overall" attrition and the Xs are the demographic variables (age at entry, gender, race, education, and AFQT category)

and the moral waiver variables (traffic, MNTRL3, MNTR3M, MSDMR, felony, drug, and alcohol). Tables 19 and 20 show the results of the effect of the explanatory variables on "overall" attrition for the Marine Corps and Navy respectively.

Table 18. Predicted Probability "Other than Unsuitability" Attrition by Navy Cohort

Variable	FY88	FY90 ^a
<u>Demographic</u>		
Age_entr	.36*	.29
Male	-10.42*	-8.44*
Black	-4.88*	-3.07*
Hispanic	-2.85*	-1.63*
OTHMIN	-5.32*	-4.53*
NONHSG	2.54*	2.72*
CATIIIA	1.29*	.78*
CATIIIB	2.04*	2.15*
CATIV	4.78*	3.92*
<u>Moral Waiver</u>		
Traffic	-1.43	-.74
MNTRL3	-1.76*	.02
MNTR3M	-3.67**	-2.54
MSDMR	-1.77*	.04
Felony	.88	-2.38
Drug	1.54*	1.04**
Alcohol	.34	-2.32***

* significant at .01

** significant at .05

*** significant at .10

^a contains only three years of data

**Table 19. Predicted Probability of "Overall" Attrition
by Marine Corps Cohort**

Variable	FY88	FY89	FY90	FY91
<u>Demographic</u>				
Age_entr	1.72*	1.68*	1.64*	1.37*
Male	-21.44*	-20.92*	-19.90*	-21.53*
Black	-1.44**	1.39***	-1.53**	-1.28
Hispanic	-12.69*	-10.37*	-12.07*	-10.57*
OTHMIN	-7.18*	-6.11*	-8.12*	-2.68**
NONHSG	13.46*	15.00*	14.75*	13.18*
CATIIIA	3.96*	3.43*	4.26*	5.42*
CATIIIB	6.11*	4.91*	9.54*	8.52*
CATIV	6.33	.48	17.85*	4.95
<u>Moral Waiver</u>				
Traffic	.92	.52	.89	-2.18**
MNTRL3	2.49	3.10***	4.63*	1.06
MNTR3M	.93	2.67	.61	-1.23
MSDMR	4.15*	2.41***	3.02**	-.17
Felony	4.03**	6.83*	5.09**	3.50***
Drug	1.31**	3.21*	4.23*	2.19*
Alcohol	4.40***	.69	-.22	-2.23

* significant at .01

** significant at .05

*** significant at .10

Table 20. Predicted Probability of "Overall" Attrition by Navy Cohort

Variable	FY88	FY90^a
<u>Demographic</u>		
Age_entr	.54*	.50*
Male	-9.25*	-7.51*
Black	-2.27*	-4.27*
Hispanic	-5.18*	-4.09*
OTHMIN	-9.88*	-11.65*
NONHSG	22.03	19.75*
CATIIIA	4.93*	4.19*
CATIIIB	6.90*	7.57*
CATIV	13.54*	13.30*
<u>Moral Waiver</u>		
Traffic	2.35	-.84
MNTRL3	3.07*	6.77*
MNTR3M	4.95**	2.40
MSDMR	5.66*	6.00*
Felony	3.10	7.06***
Drug	5.89*	7.15*
Alcohol	2.23	-0.45

* significant at .01

** significant at .05

*** significant at .10

^a contains only three years of data

The demographic variable results are consistent with previous studies. Age, education, and mental aptitude increase the probability of attriting, and gender and race decrease the probability of attriting. Previous tables show that moral waivers generally increase the probability of unsuitability attrition, and have no effect on "other than unsuitability" attrition. Since, for this study, these two categories are the subsets which comprise "overall" attrition, the variables that are significant for

unsuitability attrition are also significant for "overall" attrition, although the effect is diluted.

The results of the regression models discussed in this chapter lead to the following observations:

1. Demographic characteristics that increase the probability of unsuitability attrition in the Marine Corps are: age at entry, education, and mental aptitude.
2. Moral waivers that increase the probability of unsuitability attrition in the Marine Corps are: less than three minor non-traffic offenses, misdemeanor/serious offenses, felony, preservice drug use, and pre-service alcohol abuse.
3. The only moral waiver that affects "other than unsuitability" attrition in the Marine Corps is preservice drug use, which decreases the probability.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

There is no one solution to the attrition problem. Even with the increase in high quality recruits, the Services still average approximately 30 percent first-term, non-EAS attrition each year. There are many different causes for and types of attrition, and each must be addressed separately. If a small reduction is made in each type of attrition, overall attrition will decrease. The Marine Corps will never expunge attrition, but it can reduce attrition from the present level.

This thesis uses statistical analysis to assess the effect of moral waivers on first-term, non-EAS unsuitability attrition in the Marine Corps. The study categorizes attrition into two subsets, unsuitability and "other than unsuitability," with each subset accounting for approximately half of the attrition. Moral waivers affect unsuitability attrition, but not "other than unsuitability" attrition. A person's past undesirable behavior can predict future undesirable behavior, as theorized by the common cause model. On the other hand, since 77 percent of "other than unsuitability" attrition occurs for medical reasons, common sense dictates that a person's past undesirable behavior does not affect this subset. The results of this study support both these conclusions.

The Marine Corps cannot refuse enlistment to all individuals who have previous behavioral problems and still meet first-term enlistment requirements. However, it can change the screening criteria of the moral waiver policy to reduce the probability of unsuitability attrition, without eliminating a large portion of its supply.

The results of this analysis show that five out of the seven moral waiver categories (less than three minor non-traffic offenses, misdemeanor, felony, preservice drug use, and preservice alcohol abuse) increase the probability of attriting

for unsuitability. Of these five categories, felony has the greatest impact. Individuals who receive a felony moral waiver are 6 percentage points more likely to attrite for unsuitability than individuals who do not receive a moral waiver. Of the Marine Corps' 2,263 felons accessed between 1988 and 1991, 465 (20.5 percent) attrited for unsuitability. The replacement cost for these individuals, in 1992 dollars, is almost 15 million dollars (\$31,825 per enlistee [Ref. 48]). This figure does not include Military Occupational Specialty (MOS) training, which ranges from \$4,723 for a supply clerk to \$36,597 for a ground radio repairer. [Ref. 49] The Marine Corps also incurs non-pecuniary costs, which include disruption of unit cohesion and negative effects on morale. The costs of enlisting these 500 felons per year appear to outweigh the benefits of enlisting these individuals.

The individual characteristic that exhibits the largest impact on unsuitability attrition is non-high school graduate. A non-high school graduate is 10 percentage points more likely to attrite for unsuitability than a high school graduate. The Marine Corps accessed 7,063 non-high school graduates between 1988 and 1991. Of these, 4,877 (69 percent) required moral waivers. The Marine Corps uses the "whole person" concept when evaluating moral waiver applications, which includes considering other enlistment criteria. Since previous research establishes a strong relationship between education and behavior and performance in the military, compelling other enlistment criteria should be required for a non-high school graduate.

B. RECOMMENDATIONS

The results of this study clearly show a relationship between certain moral waivers and individual characteristics, and unsuitability attrition. To effectively use the moral waiver process to eliminate individuals who have a high risk of attriting for

unsuitability, the Marine Corps should make the following changes to its screening criteria:

1. Deny enlistment to any individual who has a felony conviction.
2. Deny enlistment to any non-high school graduate who requires a moral waiver for one of the following:
 - a. Less than three minor non-traffic offenses;
 - b. Three or more minor non-traffic offenses;
 - c. Misdemeanor/serious offense;
 - d. Drug use; or
 - e. Alcohol abuse.

Because some results of the FY91 cohort fall outside the established patterns, further research should be conducted for FY92 and subsequent years, when the data become available. This will determine whether FY91 is an anomaly or a new pattern is emerging.

APPENDIX A. MARINE CORPS UNIFORM GUIDE LIST FOR TYPICAL OFFENSES

1. Minor Traffic Offenses

Blocking or retarding traffic.

Careless driving.

Crossing yellow line, driving left of center.

Disobeying traffic lights, sign, or signals.

Driving on shoulder.

Driving uninsured vehicle.

Driving with blocked vision.

Driving with expired plates or without plates.

Driving without license in possession.

Driving without registration or with improper registration.

Driving wrong way on one-way street.

Failure to have vehicle under control.

Failure to keep to right or in lane.

Failure to signal.

Failure to stop for or yield to pedestrian.

Failure to yield right-of-way.

Faulty equipment (defective exhaust, horn, lights, mirror, muffler, signal device, steering device, tailpipe, windshield wipers, and so forth).

Following too closely.

Improper backing: backing into intersection or highway: backing or expressway: backing over crosswalk.

Improper blowing of horn.

Improper parking: restricted area, fire hydrant, double parking, (excluding overtime parking).

Improper passing: passing on right: in no-passing zone: improper lane change: passing stopped school bus with flashing lights: pedestrian in crosswalk.

Improper turn.

Invalid or unofficial inspection sticker: failure to display inspection sticker.

Leaving key in ignition.

License plates improperly displayed or not displayed.

Operating overloaded vehicle.

Racing, drag racing, contest for speed.

Speeding.

Spinning wheels, improper start.

Zigzagging or weaving in traffic.

NOTE: Consider offenses or similar nature and traffic offenses treated as minor by local law enforcement agencies as minor traffic offenses.

2. Serious Traffic Offenses

Driving with suspended or revoked license or without license.

Failure to comply with officer's directions.

Reckless driving (Fines under \$200).

Traffic violation where fine assessed exceeds \$200.

3. Minor Non-Traffic Offenses

Abusive language under circumstances to provoke breach of peace.

Altered identification (driver's license, birth certificate, and so forth), when intent is to purchase alcoholic beverages.

Curfew violation.

Committing or creating nuisance.

Damaging road signs.

Disorderly conduct: creating disturbance, boisterous conduct.

Disturbing the peace.

Drinking liquor or alcoholic beverages on train, plane, or other conveyance.

Drinking in public (non-disorderly).

Dumping refuse near highway, littering.

Failure to appear, failure to comply with a judgement, failure to answer (or disobeying) a summons, or failure to pay a fine.

Fighting, participating in a brawl.

Illegal betting or gambling: operating illegal handbook, raffle, lottery, punch board, watching cockfight.

Juvenile non-criminal misconduct: beyond parental control, incorrigible, runaway, truant, or wayward.

Liquor or alcoholic beverages: unlawful possession, consumption in public place, or open container.

Loitering.

Mischief (painting water towers, graffiti, throwing water-balloons).

Possession of indecent publications or pictures (other than child pornography offenses).

Purchase, possession, or consumption of alcoholic beverages by minor (underage drinking).

Theft, shoplifting (value \$100 or less): only if committed under 16-years of age.

Trepass on property.

Unlawful assembly.

Vagrancy.

Vandalism: injuring or defacing public property or property of another: shooting out street lights: or similar offenses where damage is assessed at \$200 or less.

Violation of fireworks law.

Violation of fish and game laws.

NOTE: Consider offenses of a similar nature as minor non-traffic offenses. In doubtful cases, apply the following rule:

If the maximum confinement under state or local law is 6-months, or less, treat the offense as a minor non-traffic offense.

4. **Serious Offenses**

Adultery.

Assault consummated by battery.

Breaking and entering vehicle/building without intent to commit a felony.

Carrying concealed weapon: possession of brass knuckles.

Check, worthless, making or uttering, with intent to defraud or deceive (\$500 or less).

Child pornography offenses.

Conspiring to commit misdemeanor.

Contempt of court (includes non-payment of child support or alimony required by court order).

Contributing to delinquency of minor (includes purchase of alcoholic beverages).

Desecration of grave.

Discharging firearm through carelessness or within municipal limits.

Driving while drunk, impaired, intoxicated, or under the influence of alcohol or drugs.

Drunk and disorderly and related offenses.

Failure to stop and render aid after accident.

Fornication.

Indecent exposure.

Indecent, insulting, or obscene language communicated directly or by telephone.

Killing domestic animal.

Leaving scene of accident (hit and run) involving no personal injury and property damage is under \$500.

Liquor or alcoholic beverage: unlawful manufacture or sale.

Looting.

Malicious/criminal mischief: throwing rocks on highway, throwing missiles at athletic contests, or throwing objects at vehicle.

Negligent homicide.

Petty larceny: embezzlement (value \$500 or less).

Prostitution.

Reckless driving (when fine assessed exceeds \$200).

Removing property under lien.

Removing property from public grounds.

Resisting arrest, fleeing and eluding.

Selling, leasing, or transferring weapons to minor or unauthorized individual.

Slander.

Shooting from highway or on public road.

Stolen property, knowingly receiving (value \$500 or less).

Theft, shoplifting (value \$500 or less). (If under age 16 and value is \$100 or less, treat as minor non-traffic offense).

Unlawful carrying of firearms: carrying concealed firearm.

Unlawful entry.

Unlawful use of long distance telephone lines.

Use of telephone to abuse, annoy, harass, threaten, or torment another.

Vandalism: injuring or defacing public property or property of another: shooting out street lights: or similar offenses where damage is assessed at over \$200.

Willfully discharging firearm so as to endanger life: shooting in public place.

Wrongful appropriation of motor vehicle: joyriding: driving motor vehicle without owner's consent (if intent is to permanently deprive owner of vehicle, consider as grand larceny under felony offenses below).

NOTE: Consider offenses of comparable seriousness as serious offenses. In doubtful cases, apply the following rule:

If the maximum confinement under state or local law exceeds 6-months or is equal to or less than 1-year, treat offense as a serious offense.

5. Felony Offense

Aggravated assault: with dangerous weapon: assault intentionally inflicting great bodily harm: assault with intent to commit felony. Assault and battery on law enforcement officer or child under 16-years of age.

Arson.

Attempt to commit felony.

Breaking and entering (all types) with intent to commit felony.

Bribery.

Bigamy.

Burglary.

Carnal knowledge of child under 16.

Check, worthless, making or uttering, with intent to defraud or deceive (over \$500).

Conspiring to commit felony.

Criminal libel.

Draft evasion.

Extortion.

Forgery: knowingly uttering or passing forged instrument (except for altered identification for purchase of alcoholic beverages).

Grand larceny: embezzlement (value over \$500).

Housebreaking.

Illegal drugs (See table 3-13 on page 3-100 for determination of eligibility).

Impersonating a police officer, civil official, military officer.

Indecent acts or liberties with child under 16, molestation.

Indecent assault.

Kidnapping, abduction.

Leaving scene of accident (hit and run) involving personal injury and/or property damage is over \$500.

Mail matter: abstracting, destroying, obstructing, opening, secreting, stealing, or taking.

Mail, depositing obscene or indecent matter.

Maiming: disfiguring.

Manslaughter.

Murder.

Obstructing justice.

Pandering.

Perjury.

Public record: altering, concealing, destroying, mutilating, obliterating, or removing.

Rape.

Riot.

Robbery.

Sedition: soliciting to commit sedition.

Sodomy.

Stolen property, knowingly receiving (value over \$500).

Theft, shoplifting (value over \$500).

NOTE: Consider offenses of comparable seriousness as a felony. In doubtful cases, apply the following rule:

If maximum confinement under state or local law exceeds 1-year, treat the offense as a felony.

**APPENDIX B. UNSUITABILITY ATTRITION INTER-SERVICE
SEPARATION CODES**

FAILURE TO MEET MINIMUM BEHAVIORAL OR PERFORMANCE CRITERIA

<u>ISC</u>	<u>Description</u>
60	Character or Behavior Disorder
61	Motivational Problems (Apathy)
62	Enuresis
63	Inaptitude
64	Alcoholism
65	Discreditable Incidents - Civilian or Military
66	Shirking
67	Drugs
68	Financial Irresponsibility
69	Lack of Dependent Support
70	Unsanitary Habits
71	Civil Court Conviction
72	Security
73	Court Martial
74	Fraudulent Entry
75	AWOL, Desertion
76	Homosexuality
77	Sexual Perversion
78	Good of the Service (in lieu of Court-Martial)
79	Juvenile Offender
80	Misconduct
81	Unfitness
82	Unsuitability
83	Pattern of Minor Disciplinary Infractions
84	Commission of a Serious Offense
85	Failure to Meet Minimum Qualifications for Retention
86	Expeditious Discharge
87	Trainee Discharge

APPENDIX C. "OTHER THAN UNSUITABILITY" ATTRITION INTER-SERVICE SEPARATION CODES

MEDICAL DISQUALIFICATIONS

<u>ISC</u>	<u>Description</u>
10	Conditions Existing Prior to Service
11	Disability - Severance Pay
12	Permanent Disability - Retired
13	Temporary Disability - Retired
14	Disability - No Severance Pay
15	Disability - Title 10 Retirement
16	Unqualified for Active Duty - Other
17	Failure to Meet Weight/Body Fat Standards

DEPENDENCY OR HARDSHIP

22	Dependency or Hardship
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OTHER SEPARATIONS OR DISCHARGES

90	Secretarial Authority
91	Erroneous Enlistment or Induction
92	Sole Surviving Family Member
93	Marriage
94	Pregnancy
95	Underage (Minor)
96	Conscientious Objector
97	Parenthood
98	Breach of Contract
99	Other

LIST OF REFERENCES

1. Quester, Aline O., "First-Term Attrition in the Marine Corps," Center for Naval Analyses, Alexandria, VA, p. 4, March 1993.
2. Flyer, Eli S., "Recruits with a Preservice Arrest History: Identification, Characteristics and Behavior on Active Duty," U.S. Army Research Office Scientific Services Program, February 1995.
3. Quester, Aline O., "First-Term Attrition in the Marine Corps," Center for Naval Analyses, Alexandria, VA, p. 20, March 1993.
4. Reich Joseph D., and Gary R. Kozlusk, "The New Recruiting Command and the Story of Marine Corps Recruiting," Marine Corps Gazette, p. 68, August 1994.
5. Commandant of the Marine Corps, Military Personnel Procurement Manual, Volume 2, Enlisted Procurement, Marine Corps Order P1100.72A, p. 3-85, 26 April 1994.
6. Gottfredson, Michael R., and Travis Hirschi, A General Theory of Crime, Stanford University Press, p. 43, 1990.
7. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 71, 1985.
8. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 173, 1985.
9. Gottfredson, Michael R., and Travis Hirschi, A General Theory of Crime, Stanford University Press, p. 15, 1990.
10. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 267, 1985.
11. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 146, 1985.

12. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 144, 1985.
13. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 137, 1985.
14. Gottfredson, Michael R., and Travis Hirschi, A General Theory of Crime, Stanford University Press, p. 136, 1990.
15. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 38, 1985.
16. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 126, 1985.
17. United States, Bureau of the Census, Statistical Abstract of the United States: 1993. Washington, DC, p. 198, 1993.
18. Gottfredson, Michael R., and Travis Hirschi, A General Theory of Crime, Stanford University Press, p. 133, 1990.
19. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 104, 1985.
20. United States, Bureau of the Census, Statistical Abstract of the United States: 1993. Washington, DC, p. 199, 1993.
21. Gottfredson, Michael R., and Travis Hirschi, A General Theory of Crime, Stanford University Press, p. 150, 1990.
22. United States, Bureau of the Census, Statistical Abstract of the United States: 1993. Washington, DC, p. 199, 1993.
23. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 466, 1985.
24. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 165, 1985.

25. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 154, 1985.
26. Silberman, Charles E., Criminal Violence, Criminal Justice, New York: Random House, p. 51, 1978.
27. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 270, 1985.
28. Flyer, Eli S., "Recruits with a Preservice Arrest History: Identification, Characteristics and Behavior on Active Duty," U.S. Army Research Office Scientific Services Program, p. 4, February 1995.
29. Fitz, Christopher C., and Michael A. McDaniel, "Moral Waivers as Predictors of Unsuitability Attrition in the Military," Defense Personnel Security Research and Education Center, Monterey, CA, p. 47, December 1988.
30. Flyer, Eli S., "Recruits with a Preservice Arrest History: Identification, Characteristics and Behavior on Active Duty," U.S. Army Research Office Scientific Services Program, p. 10, February 1995.
31. Flyer, Eli S., "Recruits with a Preservice Arrest History: Identification, Characteristics and Behavior on Active Duty," U.S. Army Research Office Scientific Services Program, p. 11, February 1995.
32. Quester, Aline O., "First-Term Attrition in the Marine Corps," Center for Naval Analyses, Alexandria, VA, p. 7, March 1993.
33. North, James H., and Adebayo M. Adedeji, "Rankings by Historical Attrition Rates of Potential Marine Corps Recruits," Center for Naval Analyses, Alexandria, VA, p. 2, September 1991.
34. North, James H., and Adebayo M. Adedeji, "Rankings by Historical Attrition Rates of Potential Marine Corps Recruits," Center for Naval Analyses, Alexandria, VA, p. 2, September 1991.
35. Gottfredson, Michael R., and Travis Hirschi, A General Theory of Crime, Stanford University Press, p. 134, 1990.

36. United States, Bureau of the Census, Statistical Abstract of the United States: 1993, Washington, DC, p. 199, 1993.
37. Laurence, Janice H., "Education Standards in the Military: The Way They Were, Are, and Will Be," Human Resources Research Organization, Washington, DC, September 1993.
38. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 270, 1985.
39. Eitelberg, Mark J. Manpower for Military Occupations, Human Resources Research Organization, p. 73, 1988.
40. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 154, 1985.
41. Lang, Darryl A., and Norman M. Abrahams, "Marine Corps Enlistment Standards: Trends and Impact of Waivers," Navy Personnel Research and Development Center, San Diego, CA, p. 5, July 1985.
42. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 267, 1985.
43. Binkin, Martin, and Mark J. Eitelberg, Blacks and the Military, The Brookings Institution, p. 76, 1982.
44. Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, p. 104, 1985.
45. Flyer, Eli S., "Recruits with a Preservice Arrest History: Identification, Characteristics and Behavior on Active Duty," U.S. Army Research Office Scientific Services Program, p. 3, February 1995.
46. Afifi, A.A., and Virginia Clark, Computer-Aided Multivariate Analysis, 2nd ed., New York: Chapman & Hall, p. 321, 1990.
47. Gujarati, Damodar N., Basic Econometrics, 3rd ed, McGraw-Hill, Inc., p. 565, 1995.

48. Quester, Aline O., "First-Term Attrition in the Marine Corps," Center for Naval Analyses, Alexandria, VA, p. 8, March 1993.
49. Quester, Aline O., "First-Term Attrition in the Marine Corps," Center for Naval Analyses, Alexandria, VA, p. 8, March 1993.

BIBLIOGRAPHY

- Afifi, A.A., and Virginia Clark, Computer-Aided Multivariate Analysis, 2nd ed., New York: Chapman & Hall, 1990.
- Binkin, Martin, and Mark J. Eitelberg, Blacks and the Military, The Brookings Institution, 1982.
- Chief of Naval Operations, Navy Recruit Manual, COMNAVCRUITCOMINST 1130.8D, CH-30, 9 June 1995.
- Commandant of the Marine Corps, Marine Corps Separation and Retirement Manual. Marine Corps Order P1900.16 with CH-4, 27 June 89.
- Commandant of the Marine Corps, Military Personnel Procurement Manual, Volume 2, Enlisted Procurement, Marine Corps Order P1100.72A, 26 April 94.
- Eitelberg, Mark J. Manpower for Military Occupations, Human Resources Research Organization, 1988.
- Fitz, Christopher C., and Michael A. McDaniel, "Moral Waivers as Predictors of Unsuitability Attrition in the Military," Defense Personnel Security Research and Education Center, Monterey, CA, December 1988.
- Flyer, Eli S., "Recruits with a Preservice Arrest History: Identification, Characteristics and Behavior on Active Duty," U.S. Army Research Office Scientific Services Program, February 1995.
- Gottfredson, Michael R., and Travis Hirschi, A General Theory of Crime, Stanford University Press, 1990.
- Gujarati, Damodar N., Basic Econometrics, 3rd ed, McGraw-Hill, Inc., 1995.
- Krulak, Charles C., Commandant, USMC, Commandant's Planning Guidance, Headquarters United States Marine Corps, Washington, DC, 1 July 1995.

- Lang, Darryl A., and Norman M. Abrahams, "Marine Corps Enlistment Standards: Trends and Impact of Waivers," Navy Personnel Research and Development Center, San Diego, CA, July 1985.
- Laurence, Janice H., "Education Standards in the Military: The Way They Were, Are, and Will Be," Human Resources Research Organization, Washington, DC.
- Means, Barbara, "Moral Standard for Military Enlistment: Screening Procedures and Impact," Human Research Organization, Alexandria, VA, November 1983.
- North, James H., and Adebayo M. Adedeji, "Rankings by Historical Attrition Rates of Potential Marine Corps Recruits," Center for Naval Analyses, Alexandria, VA, September 1991.
- Quester, Aline O., "First-Term Attrition in the Marine Corps," Center for Naval Analyses, Alexandria, VA, March 1993.
- Quester, Aline O., James H. North, and Theresa H. Kimble, "Identifying Successful Marine Corps Recruits," Center for Naval Analyses, Alexandria, VA, April 1990.
- Reich Joseph D., and Gary R. Kozlusk, "The New Recruiting Command and the Story of Marine Corps Recruiting," Marine Corps Gazette, August 1994: 63-69.
- Silberman, Charles E., Criminal Violence, Criminal Justice, New York: Random House, 1978.
- United States, Bureau of the Census, Statistical Abstract of the United States: 1993. Washington, DC, 1993.
- Wilson, James Q., and Richard J. Herrnstein, Crime and Human Nature, New York: Simon and Schuster, 1985.

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